

# History

## Dr. Albert Clifford Abbott: pioneer surgeon of western Canada

ROBERT E. BEAMISH, MD

After two periods of study in Britain and the continent and many visits to centres in the United States, Dr. Albert Clifford Abbott began a long career of clinical and experimental surgery that led to important medical observations and surgical treatments. Influenced by the surgical research laboratories in Edinburgh and by the world's authorities in thyroid disease, Abbott began his studies of the thyroid in humans and animals that later changed several existing concepts.

He later performed experiments on the formation of bone in surgical wounds, the wrapping of aortic aneurysms with tantalum gauze and the replacement of the ureter with a loop of the ileum.

When asked to describe the most interesting case in his career, Abbott responded: "In 1954 a 20-year-old girl came to the clinic with dull abdominal pain, more or less constant in both loins. An intravenous pyelogram revealed huge bilateral hydronephrosis. The urine was loaded with pus. We [repaired] her left side, which was more marked, and left a drain in the kidney... We [later] did the same on the right kidney. There was no improvement. Her left kidney stopped functioning and was removed. Condition stationary! We explored her right kidney through the abdomen and found there was no blockage at the repair. I decided that we were dealing with an adynamic kidney which could not contract and empty her lower calyx. Our research gave us the idea of taking a small length of isolated small bowel and making a new ureter draining the very bottom of the



Abbott: extraordinarily imaginative.

kidney. We explained this to the girl and her mother. It was experimental and had never been done before in humans, but we [had done it on many] dogs. We also said that she should be sterilized, as we did not believe that the amount of kidney tissue left would carry her through a pregnancy. They agreed. She was admitted to Grace Hospital and this procedure was carried out. She made a very good recovery. Her urine was clear and her electrolytes normal in 2 weeks. It is now 25 years later. She sleeps with the head of her bed elevated 6 inches to prevent reflux. Her electrolytes are normal and she is in excellent health."

Dr. Abbott was born on a farm in Stockton, Man. in 1897. When he was in the fourth grade he and several members of his family acquired typhoid fever during a duck shooting trip. His father became so ill that he was unable to continue farming. The family moved to Winnipeg, where Abbott attended Wes-

ley College and received a BA in 1917. He graduated from the Manitoba Medical College in 1921. After a year's internship at the Winnipeg General Hospital, Abbott completed another year at the Swansea General and Eye Hospital in Wales, made possible by a travelling scholarship, where he performed more than 800 operations. Thus began the travels and studies that were to mark Abbott as the pioneer experimental surgeon of western Canada.

When Abbott first began his experimental surgery on dogs there were no animal care facilities at the medical school. When he operated on dogs in the department of physiology he took them home in the back seat of his car. His wife, a highly trained zoologist and an instructor at the University of Manitoba, nursed the dogs until they were well enough to be moved to a farm for complete recuperation. This practice continued for several years until suitable accommodation for the dogs was provided at the medical school.

At the end of 1927 Abbott and his wife decided to do a year's postgraduate study on the continent. Abbott went to Professor Dequervain's clinic in Berne, Switzerland. In an interview in 1979 Abbott said: "Professor Dequervain was a world authority on thyroid disease at the time. It was an interesting experience. We started operating at 7 am on two tables in one room. Only the professor used rubber gloves. The rest of us used cotton gloves and cotton linen thread for sutures and ligatures. There were not funds for catgut and silk. At 9 am the professor arrived. Everything stopped except our breathing. Everyone stood at attention, clicked their heels and said Good morning, Herr Professor."

Dr. Beamish is professor of medicine at the University of Manitoba and associate physician at the Winnipeg Health Sciences Centre.

While in Vienna for 3 months, Abbott worked chiefly with Professor B. Von Breitner, the "Angel of Siberia" — a title he earned while a prisoner of the Russians. Although the professor was threatened with execution many times during his imprisonment, his surgical ability always saved him. He was very interested in thyroid disease and had removed many thyroids from children. To Abbott's surprise, these glands showed the hyperplastic features found in hyperthyroidism and Graves' disease; this provided further stimulus to Abbott's later work on the thyroid gland.

On his return to Winnipeg Abbott resumed his practice and became the chief of surgery at St. Boniface General Hospital. He was also the chief of surgery at St. Joseph's Hospital and associate professor of surgery at the University of Manitoba. During this period he made annual month-long visits to the departments of surgery and pathology in St. Paul, Minnesota and the Cleveland Clinic, published 46 papers, and delivered lectures all over North and South America. He retired in 1957, when he was 60 years old.

In 1930 Abbott met Dr. R.P. Ball, a pathologist at the Cleveland Clinic, and told him about a British book he had read on thyroid disease that described features in the fetal thyroid that Abbott felt were simply postmortem changes. They agreed to investigate the problem. In his 1979 interview Abbott said: "How to do it was the problem. I thought if we could inject the neck of the still-born in the region of the thyroid with formalin immediately after birth, possibly we could collect 100 cases... with no postmortem changes... The changes described in the British publication were not there, but there were different histological findings present. How could we check the mother's thyroid and the fetus? Why not in thyroids of cows obtained at the abattoir?"

"Mr. Joseph Harris, who was head of Canada Packers, was... good enough to arrange with the veterinary personnel on the killing floor to help me. I went out with many small cans containing formalin. When they killed a cow, they removed the thyroid and adrenals. It was surprising how many cows were

pregnant. If there was a fetus, they removed the thyroid and gave me the age of the fetus... the gland was placed in the tin with the mother's thyroid. We also collected the pituitary. All these cans were then taken up to the pathology department of the St. Boniface Hospital. Here, all the glands were sectioned and slides made. I might say that all this work was done free. Dr. J. Prendergast, pathologist at St. Boniface Hospital, and I examined each set of slides of the mother and fetus. Many long, tedious hours were spent... We found that after the sixth month, the histology of the fetal thyroid was the same as the mother's. If the mother's thyroid was hyperplastic, so also was that of the fetus. They were never different."

Abbott and Prendergast published their findings, describing the microscopic picture of 667 thyroid glands obtained from calves, yearling cows, mink, fox, sheep, hogs, horses, range cows and buffalo. This formed the first comparative study of the thyroid glands of a wide variety of wild and domestic animals from the same geographic area.

Another aspect of Abbott's research was ectopic bone formation. His account is as follows: "My work on bone formation arose from the fact that a patient, following a prostatectomy, developed a large sheet of bone in his lower abdominal incision. Following consultation with one of our older doctors, who expressed the opinion that it was probably cancer, the patient immediately took off for the Mayo Clinic. He was told that I had accidentally included a piece of the lining of the bladder in the incision. Having myself closed the wound, I was unhappy with this decision. As a result, I decided to find the truth of the matter. I applied and received a grant from the Banting Research Foundation and started out on a long series of experiments.

We transplanted bladder mucosa and, in some cases, the full thickness of the bladder wall in about 300 animals: dogs, cats, guinea pigs and rats. We found that if you took a square inch of bladder mucosa and transplanted it into the rectus sheath, you produced a definite cyst; one wall lined with bladder mucosa

and the other side true bone. It was never larger than the original transplant, usually a little smaller. Therefore, the bone in my patient's belly wall — 50 times larger than a graft 1 inch square — could not have been due to accidentally enclosing a small portion of his bladder wall in his incision."

To perform new procedures or improve established ones surgeons often invent new instruments. Abbott was no exception. He devised new instruments for sympathectomies, a new common duct dilator and stone basket, and a new instrument for operative cholangiography.

Abbott's energy and creativity were not limited to a single channel, as evidenced by his excellence in sports. In 1918 he starred with the famous old Victoria Hockey Club of Winnipeg when it was a contender for the Allen Cup. For many years he played with the Winnipeg Lacrosse Club, and in 1920 he was a member of the Edmonton lacrosse team when it contested the Mann Cup, emblematic of the amateur championship of Canada. He also played soccer for several major leagues in Winnipeg. This energy was later turned to fishing and big game hunting — crocodiles, wild boar and kangaroos in Australia, a Kodiak bear in Alaska, and three marlin, each about 90 kg, off the coast of Mazatlan in Mexico.

Neither did Abbott neglect his community nor the numerous professional organizations he belonged to. He was a founder and the first president of the Canadian Association of Medical Clinics, a founder and later president of the Winnipeg Winter Club, and for more than 10 years a board member and officer of the International College of Surgeons. For these and many other contributions he has twice been honoured by the City of Winnipeg for good citizenship and community service, and the University of Winnipeg conferred upon him an Honorary Doctor of Laws in 1974.

These glimpses into the achievements of Abbott's long and productive life reveal that he was extraordinarily imaginative in a practical way, contributed to medical knowledge and surgical technique, and was a pioneer in experimental surgery in western Canada. ■